Got an Idea? We Want to Hear!

Tech Solutions is an innovative, transformational business process created by the Chief of Naval Research and focused solely on rapidly delivering needed technology to the Fleet/Force. This is accomplished several ways:

Technology search and analysis services
Rapid prototyping of technologies to meet specific requirements
Demonstrations of available technologies and conceptual systems

The goal of ***Tech Solutions*** is to provide Sailors and Marines web-based access to the Naval Research Enterprise. This access, via both Internet and SIPRnet, targets **E-4 to O-4's** that work daily at the deckplate/ground level on ways to improve mission effectiveness through the application of technology. Improvements from this effort are intended to help move the sea services toward goals of more effective and efficient use of personnel.

Tech Solutions is not a substitute for the acquisition process and is not a replacement for the Systems Commands. Our goal is to provide the Fleet/Force with prototypes that delivers **50–70% solutions** addressing immediate requirements and can be easily transitioned by the acquisition community. That is why Tech Solutions structures every project with definable metrics and includes appropriate Systems Command elements in an Integrated Product Team concept. This ensures transition "hook points" are built into the solution which enable the acquisition authority to move directly to final prototyping or a decision to buy.

To be successful, ***Tech Solutions*** needs engagement and active involvement by the Fleet/Force. Every query will be answered, even if it doesn't result in a project. And if a demonstration is performed or prototype is developed, the submitter will always be involved in the process through final delivery of the technology.

In summary, ***Tech Solutions***:

- Focuses on improving the effectiveness of Sailors and Marines
- Provides a direct means for the Fleet/Force to reach the S&T community
- Delivers a demonstration or prototype within 12 months

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FRS Scheduler

Tech Solutions Partner:

NAVAIR

Problem: Fleet Readiness Squadrons need a better ability to coordinate flight events such as; student pre-requisites, range, instructor qualifications, ordnance, aircraft configuration, weather & crew rest.

Solution: Develop an automated process to produce optimized flight/trainer schedule with manual intervention options to allow flexibility for daily changes that occur during execution.

Impact: Decrease scheduling effort by providing automated tool that tracks requirements, availability of trainer and equipment resulting in near optimum daily schedule.

Non-Skid Deck Scrubber

Tech Solutions Partners:

NSWC Carderock

Tenant Corporation

Problem: Cleaning the non-skid surface on the carrier is time and labor intensive. Takes 100's of sailors with push brooms, detergent, & fire hoses working over two days

Solution: Develop a non-skid scrubber (similar to a Zamboni machine) that can adequately remove dirt, grease, and oil and restore the gripping effectiveness of the deck of aircraft carriers and large deck amphibs.

Impact: Developed a non-skid scrubber that can adequately remove dirt, grease, and oil and restore the gripping effectiveness of the deck of aircraft carriers and large deck amphibs.

Sub Scheduler

Tech Solutions Partners:

NUWC Newport

Werner Anderson, Inc

- **Problem:** Growing multi-mission demands and a reduced force structure environment require increased efficiency in employing assets to conduct missions and training.
- **Solution:** A single integrated database for submarine schedule and readiness data with a scheduling engine that can best-fit future deployments to ship configuration, training and fuel capacity, as well as best-fit current schedule questions using operational readiness indicators
- **Impact:** Accommodates 10 yrs of schedules. Allows changing any element of the schedule and applying that change to the rest of the force with minimal user input and effort. This will save many hours and greatly improve the efficiency of the submarine force.

Paveway Munitions Planning

Tech Solutions Partner:

NAVAIR

•**Problem:** Current tools do not integrate with the user's mission planning surface and does not provide a suitable description of the release point for weapons planning.

•**Solution:** Develop the capability for the end user to present a "God's eye", or overhead view of the weapon's release point and then integrate that data with the Navy Portable Flight Planning System (N-PFPS).

•**Impact:** Allowed for mission planning to return to operator level. Reduced planning burden and increased aircrew confidence in successful mission execution. Released in JAWS (JMEM Air to Surface Weaponeering System) provides access by Navy and Air Force crews.

Small Weapons Attack Trainer

Tech Solutions Partners:

NFESC

Mercury Racing

Robotek International

Navy

- **Problem:** The need for an effective small arms (.50 cal through CIWS) training device for deploying ships and embarked helicopters that lack available, realistic targets to simulate small, high speed attack boats.
- **Solution:** Develop a target that is deployable, expendable, and towed by a Remote Water Craft (RWC) with a visual means to score rounds that hit the target. Additionally, integrate a heavy fuel engine into the RWC to advance efforts in small marine heavy fuel engines.
- **Impact:** Provides Commanding Officers the ability to deploy a realistic ship deployable mobile small boat attack trainer anywhere and anytime. Elevates remote target services request

Wearable Wireless Computer

Tech Solutions Partners:

SPAWAR SSC

Bath Iron Works

General Dynamics

Lenel Systems

- **Problem:** The need for maintainers to take voice, video, & data computing to the place of work, extending NMCI/IT-21 to the sailor on the deck plates and flight lines without the use of laptop computers

- **Solution:** The employment of Wearable Wireless Computers (WWC) to support the automation of maintenance actions. Allows for access to technical resources, specs, virtual test equipment and supervisory direction without traveling back to the work center.

- **Impact:** Reduce time associated with individual maintenance tasks. Quantitative measurement of time savings through evaluation of key metrics before and after deployment of WWC.

Air Quality Monitoring

Tech Solutions Partners:

NSWC Carderock

Dräger

Enmet Corp.

Thermo Gas Tech

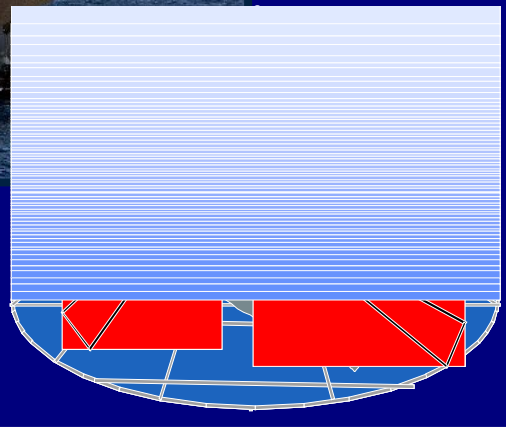
Industrial Scientific

Problem: Need simple, hand helds which provide analysis for life gases and trace species. Use common analyzers to satisfy requirements for weekly monitoring, gas free engineering, damage control and escape and rescue.

Solution: Procure/develop/test, in the lab and aboard, cost-effective replacements for the Drager colorimetric tubes used for gas measurements aboard subs.

Impact: Replaces Dräger tubes on subs with 3 electronic reusable sensors. Eliminates the need to stock, store and dispose of hundreds of tubes. The electronic sensors can be changed out in contamination. Air quality data reporting will greatly improve.

CV/CVN Surveillance

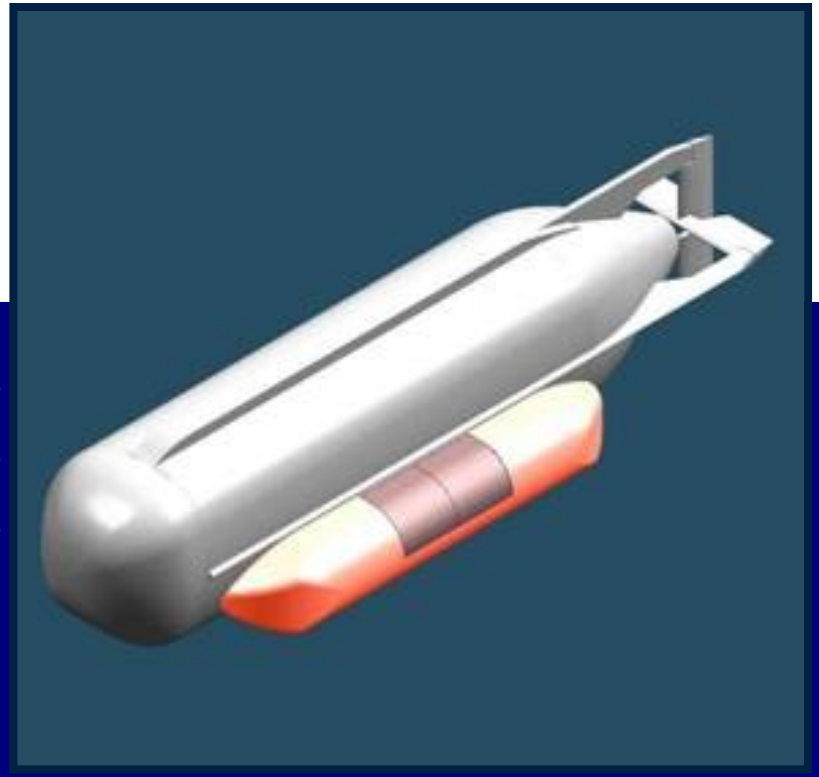


Tech Solutions Partner:

NSWC Crane

- **Problem:** The need for 360˚ situational awareness for ship's perimeter while inport and at anchor without extensive use of manpower and effective networked communications.
- **Solution:** Develop a system to be used when approaching inport areas, pierside, at anchor or navigating canals that would provide increased capability for ship’s security forces during heightened FP conditions.
- **Impact:** Provide automated system for identification and tracking of contracts enabling maximum time possible for evaluation of situation. Eliminates reliance on manual scanning and identification of contacts.

Seal Delivery Vehicle (SDV) Canisters



Tech Solutions Partner:

NAVSEA Coastal Systems Station

Problem: The SDV has limited internal space. Requirements for emerging mission packages are quickly consuming all possible internal space in the boat.

Solution: Using 3-D modeling software and Human Factors engineering to design canisters that are neutrally buoyant, can be attachment and removal in-water by divers, and are hydro-dynamically shaped to minimize drag and noise.

Impact: Provide SEAL Divers ability to deploy with equipment required for complex mission profiles.

Fleet Battle Lantern

Tech Solutions Partners:

NSWC Carderock

Northrup Grumman Newport News

Problem: Portable Battle Lanterns require DCPO's to perform constant battery and bulb maintenance. This results in high parts costs, increased HAZMAT disposal issues and considerable investment of valuable man-power hours.

Solution: Develop a dependable waterproof non-sparking, ruggedized portable Battle Lantern with advanced LED bulb and rechargeable battery technology which can be retrofitted into existing Battle Lanterns.

Impact: Increased reliability and service life potential saving approximately 25 maintenance man years and $6 million in battery cost. Also, a reduction in hazmat storage and disposal.

Data Transmission

Tech Solutions Partner:

NAVAIR

Problem: Mobile device to mobile device transmission of classified imagery.

Solution: Develop a suite of handheld devices that transmit encrypted images over a secure communications path.

Impact: Provide capability to transmit various file types from ground to air. Increase real time situational awareness.

Underwater Communications

Tech Solutions Partner:

NAVSEA Coastal Systems Station

Problem: SEAL Divers need an enhanced capability to communicate to other Divers, SDV's and support vehicles.

Solution: Replace a standard mouthpiece with a mouthpiece with the suitable electronics to transmit voice underwater from diver to diver. This would enable diver to diver, and diver to submarine communications and greatly improving operational safety through better communications

Impact: Provide new capability of direct voice communications between SEAL divers in water, in SDV and to/from SDV (operator to operator and multi-operator "comm rope").

Aircraft Restraint Mechanism

Tech Solutions Partner:

Penn State Applied Research Lab

Problem: Need a way to slow/stop aircraft from sliding off aircraft carrier decks, maximizing safety to the flight deck crew.

Solution: Develop a Reaction Energy Absorbing Motion Restraint based on a combination of stitch ripping devices, a custom-designed pad-eye engagement hook, and the connecting ancillary hardware.

Impact: Reduction in mishaps on the flight deck and improvements in flight deck safety.

Search and Rescue Marker

Tech Solutions Partner:

NAVAIR

Problem: Need a marine location marker that is both non-flammable, and will not cause "blooming" of NVGs. It must be visible from an aircraft, day or night, with the naked eye, capable of being air-launched through the cabin door of a helicopter, expendable, sea water activated and self-scuttling. Selectable operational time, radar reflective and detectable by Navy aircraft radars is highly desirable.

Solution: Develop a low cost, air droppable, time selectable watertight float to house the SAR equipment buoy by modifying existing hardware with advanced technology.

Impact: Increased effectiveness of marking survivor or debris, markers increase visibility in daylight and markers are visible

Aerial Gunnery Training System (AGTS)

Tech Solutions Partners:

NFESC

Mercury Racing

Robotek International

Wing Inflatables

Nautilus Covers

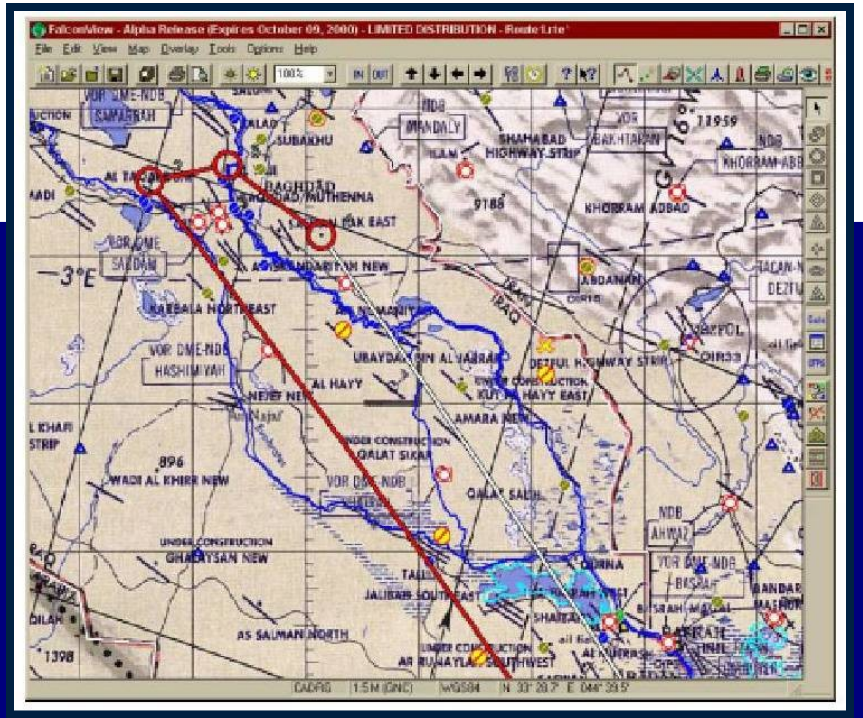
Northwind Marine

TECH Solutions

DEPARTMENT OF THE NAVY ONR Science & Technology

- **Problem:** There is no realistic unmanned, high speed, cost effective, alternative fuels mobile training system for Air Gunners. SH-60B Air Gunners have limited range time to qualify 50M Gunners for training to combat a simulate small, high speed attack boats.
- **Solution:** Develop a high speed (40 Knot), very stabile (Sea State 3), cost effective, alternative fuels, unmanned mobile training system that can be operated and deployed by shipboard and or land positions. In addition develop a target that can be pulled by this training system that can sustain sea state 3 at 40 Knots.
- **Impact:** Establishes the roadmap for navy's implementation of Alternative Fuels Engines, removing the requirement for MO-Gas onboard. Provides for the first mobile training target for Air Gunners.

USMC Moving Maps



Tech Solutions Partner:

NAVAIR

Problem: The current operating procedures require the UH-1N/AH-1W/CH-46/CH-53/SH-60B/SH-60F/ HH-60H/F14 crews to utilize paper maps and use crew carried lighting to read them at night. All navigation and mission prep work must be manually placed on the map and require the crew to follow desired routing via contact navigation.

Solution: Combine GOTS lap top moving map display, GPS, and portable flight planning system/ FalconView software to provide detail position data, route, training information, user defined way points, and threat information.

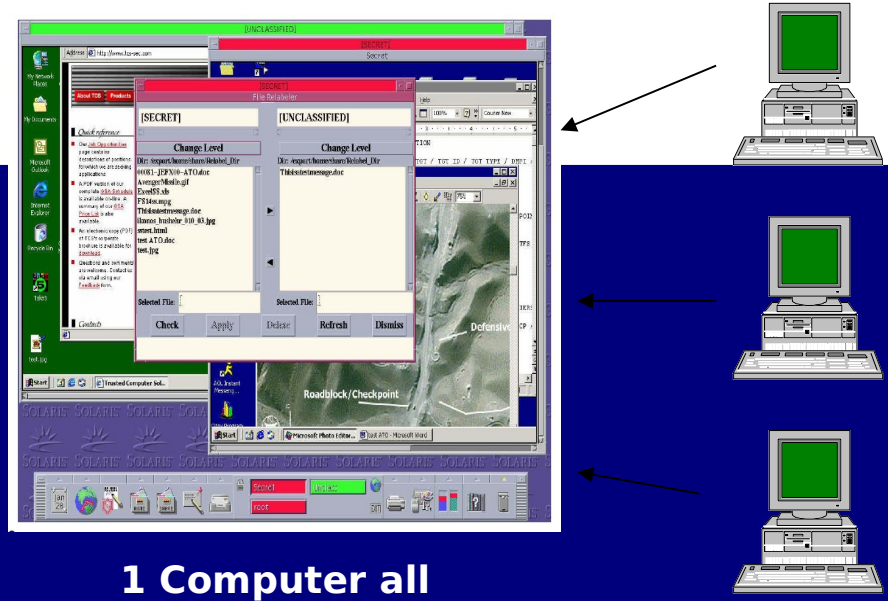
Impact: Provide real time situational awareness route and timing information allowing for on-the-fly adjustments. Allows the aircrew to concentrate on tactical employment aspects of mission while reducing navigation and mission planning

Multi Level Security

Tech Solutions Partners:

SPAWAR SSC

Darlington Inc.



1 Computer all Classifications

- **Problem:** The IT footprint of today's navy architecture requires 3 Desktop computers to perform each classification processing. This requirement increases the maintenance and administration for the sailor by 3 fold.

- **Solution:** To develop a multilevel security desktop/system that allows for the processing of all security classifications including web, data and imagery.

- **Impact:** Provides for the reduction of the Navy's IT footprint by 10 percent. Reduces the number of man-hours required for maintenance and administration. Provides the war-fighter with the full common operating picture on one desktop

Engine Oil Analysis

Tech Solutions Partners:

Naval Research Laboratory

Foster Miller

- **Problem:** Need rapid real-time ability to analyze engine oil samples to predict potential diesel engine problems and greatly reduce catastrophic engine failures
- **Solution:** An effective oil analysis tool that can diagnose and predict potential diesel engine problems through identification of specific fault and wear modes and provide identification of potential problems. Develop technology that is portable, automatic and capable of providing specific machinery health information on the spot.
- **Impact:** Phase I will provide usable real-time data that will indicate probable engine failures well in advance of actual casualty. Enables repairing small, inexpensive problems before a catastrophic failure. This will minimize reduced capabilities of ships and yard time.

Closed Circuit Rebreather

Tech Solutions Partners:

NAVSEA Dahlgren

US Naval

Problem: Looking for a 100% Rebreather Dive Rig capable of switching to semi-closed mode for deeper depths. Rig must weigh less than 25 pounds ready to dive.

Solution: Leverage ONR-sponsored research in rebreather technology to design, fabricate and test a rebreather circuit capable of being manually switched between closed circuit mode using pure oxygen and semi-closed circuit operations to provide divers with a stable, and predictable circuit oxygen levels across their full range of depths and activity levels.

Impact: Provide at depth capabilities using one piece of equipment for new mission profiles. Current equipment available does not meet all mission requirements.

Bandwidth Optimization

Tech Solutions Partners:

SPAWAR SSC

Expand Networks

- **Problem:** The lack of bandwidth required for continuous utilization of Sailor Phones, World Wide Web access and email for the sailor.

- **Solution:** To introduce optimization technologies that enhance the delivery and receipt of data across small bandwidth satellite systems.

- **Impact:** Provides for increased data flow by 4 fold through limited bandwidth satellite connections. Ensures bandwidth is available for sailors continuous usage of Sailor Phones, Email and World Wide Web Access.

SDV Transponders

Tech Solutions Partner:

NAVSEA Coastal Systems Station

Problem: Due to currents, sea-states and other variables, re-locating the SDV at night somewhere offshore is very difficult with present technology.

Solution: Build a light weight, compact DS3 tracking system for the shore detail that is capable of providing the SDV with a bearing and distance within 1000yds to facilitate in-water recovery.

Impact: Greatly improves mission success and safety of teams.

Blue Force Tracking

Tech Solutions Partner:

Innovative Solutions International

Problem: Need a space-based tracking, location, and data communication capability that can be used anytime, anywhere in the world to enhance Marine operations to support peacetime and wartime.

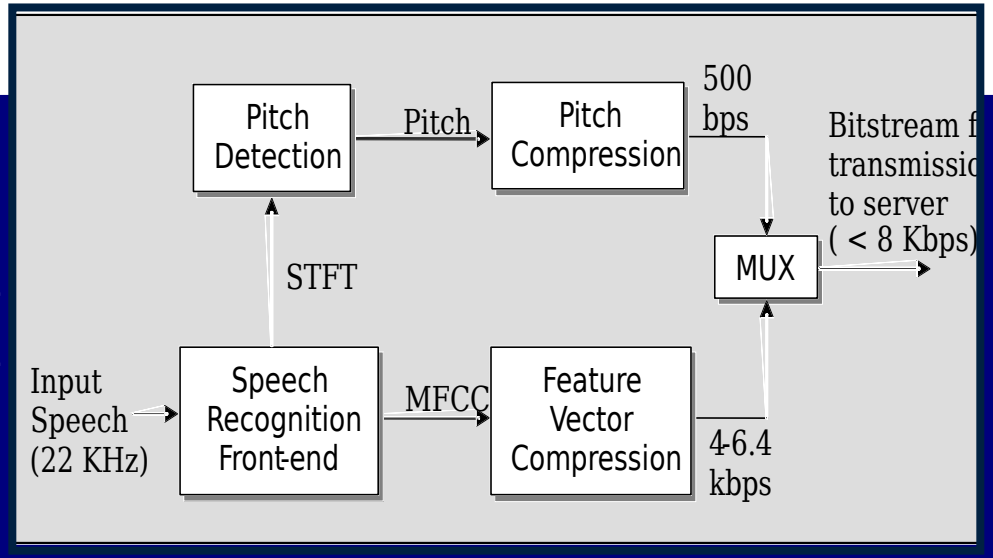
Solution: Conduct a proof of concept to evaluate the capability of GPRS and Data Automated Communications Terminals (DACTs) to support Marine operations. The GPRS system will be integrated in DACTs which resides on various US Marine Corps (USMC) vehicles to provide this currently deployed line of sight (LOS) system with an OTH capability which will greatly enhance the operational range of the system.

Impact: Demonstrate Over The Horizon capability in existing

Voice to Text

Tech Solutions Partner:

Speech Gear



Problem: Need to capture radio communications during exercises in a text format and make it available in a web accessible data base.

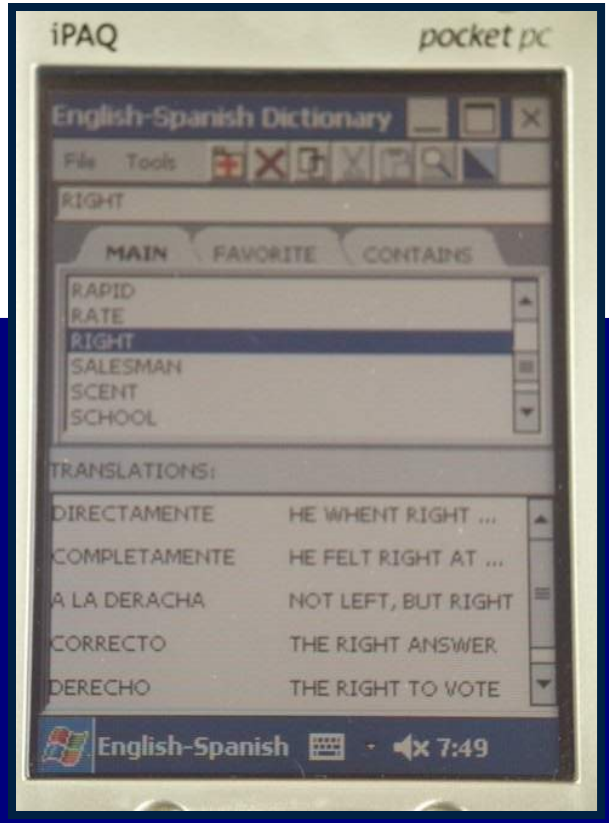
Solution: Use advanced speech algorithms to capture and decipher radio communications.

Impact: Enables all members of an exercise to access radio communications for exercise reconstruction. Will also be highly useful in real actions.

Text to Text

Tech Solutions Partner:

Speech Gear

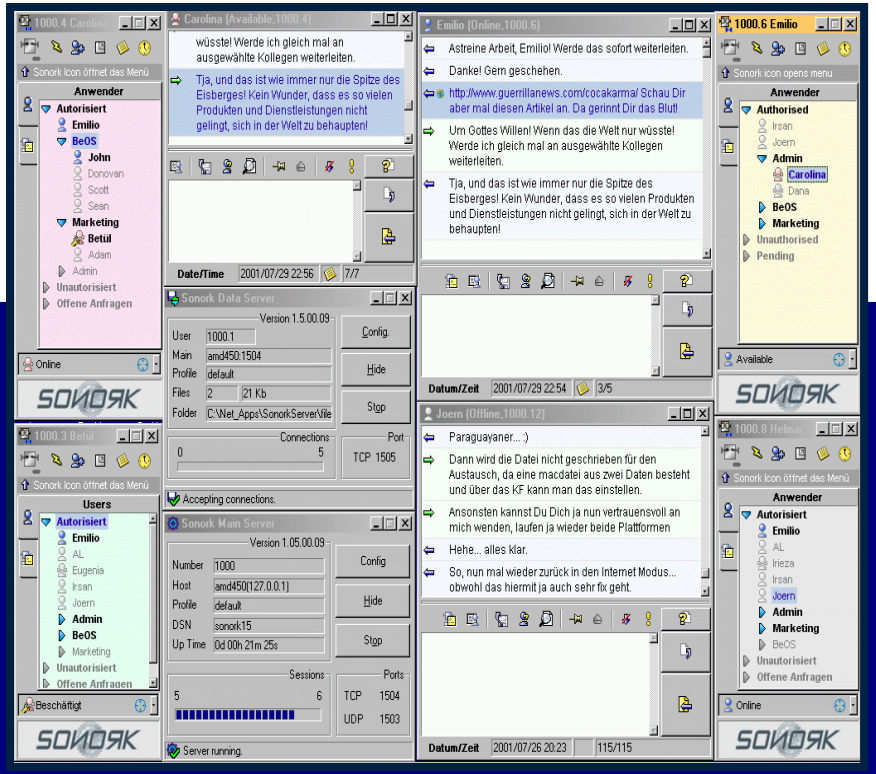


Problem: Need to translate Power Point slide from English to Korean, for briefing purposes

Solution: Use a variant from speech algorithms in Voice to Text tech solution to effect translation.

Impact: Will save 10's of man-hours per slide show presentation

Coalition Chat Line



Tech Solutions Partners:

SPAWAR SSC

Eumetria Inc.

Mitre

Problem: The increased emphasis on operating in a coalition environment, for exercises or real-world scenarios, is limited by current force ability to communicate across a plethora of languages as well the limited number of linguist available or trained.

Solution: A collaborative tool that translates, near real-time, written text into multiple languages at classified or unclassified levels. A system capable to translating American English, French, German, Italian, Spanish, Russian and Turkish.

Impact: A collaborative tool which provides U.S., Coalition or NATO forces with an ability to effectively communicate operational data as well as technical and non-technical

Helmet Mounted Comms

Tech Solutions Partner:

NSWC Carderock Combatant Craft Division

Problem: Helmets that provide ballistic and impact protection need communications components that provide a modular and integrated system of components to allow the operators wired/wireless, single/dual channel intercom and radio communications in high noise combat vehicle environments.

Solution: In Process

Portal Casting

Tech Solutions Partners:

SPAWAR SSC

Darlington Inc.

Problem: In today's navy limited bandwidth effects the sailor ability to maintain continuous access to the world wide web. Fifty percent of bandwidth utilization is caused by WWW access by the sailor.

Solution: Portal Casting provides for the re-direction of WWW data to a very under utilized Global Broadcasting System. In addition utilizes state-of-the-art web caching program to ensure data integrity for the sailor.

Impact: Portal Casting will reduce the amount of bandwidth requirements on NIPR and SIPR Networks by 40 Percent allowing for quicker and more access to the WWW. While providing

Non Skid Demonstration

Tech Solutions Partner:

Naval Research Laboratory

Problem: Non-skid currently used aboard aircraft carriers is not durable enough to withstand numerous tail hook strikes during aircraft recover operations.

Solution: A product similar to bed liner material used in trucks may be a possible replacement non-skid coating for carriers. Qualification tests are required before test patches can be placed shipboard for evaluation.

Impact: Complete required qualification testing so that potential new non-skid material can be tested shipboard.

Portable Solar Energy Source

Tech Solutions Partners:

NSWC Crane

Global Solar

Problem: 2d Radio Bn Reconnaissance Teams and our Manpack SIGINT Support Teams would like to lighten their battery load.

Solution: Investigate the use of portable solar panels as an energy source.

Impact: Decrease the weight of existing batteries by replacement with portable solar panels.

I2P2

Tech Solutions Partners:

NAVSEA Carderock

Northrup Grumman Mission Systems

Problem: Current methods for access and entry are outdated and extremely manpower intensive.

Solution: Develop an integrated system to combine biometrics, security database, and identification methods into one seamless solution.

Impact: Demonstrate cutting-edge technology inside the walls on ONR. Lessons learned can be applied to Fleet/Force Commands seeking similar solutions.

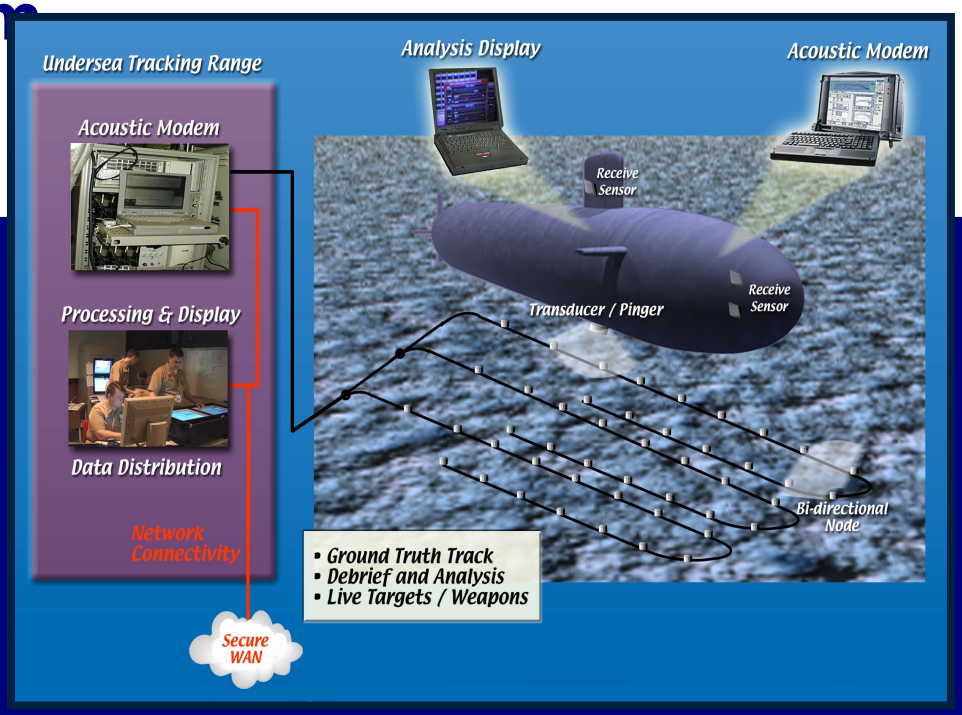
Electronic Deck Log

Tech Solutions Partner:

Johns Hopkins University Applied Physics Lab

- **Problem:** Optimal manning of ships will greatly benefit from an automated means of accurately and efficiently recording bridge information.
- **Solution:** Current and emerging computer technologies will be used to demonstrate new ways of managing shipboard operational information. Verbal conning orders and dictated log entries will be consolidated with navigation data elements and engine performance data to produce a comprehensive, accurate and legible deck log. The Automated Electronic Deck Log will archive original data, produce an operator-readable logs and standard reports. Capture of conning orders will be accomplished by automated recording, voice recognition/voice activation, automated data entry, or a combination of all three.
- **Impact:** Improve bridge watch team efficiency, increase

Tactical Readiness Evaluation Debrief System (TREDS)



Tech Solutions Partner:

NUWC Newport

Problem: Need for an improved surveillance system for capturing, analyzing, and presenting sub exercise information, and improve the training value.

Solution: Using acoustic communications between operating submarines and the TREDS system, operating data (from shipboard tactical systems and the tracking range) will be collected in real-time, fed directly into a data fusion engine, and then to analysis. A systematic knowledge management process will automate analysis and reconstruction through algorithms and models representing fleet-approved metrics. Reconstruction tools will provide the user with a clear picture of what happened during the exercise, and analysis tools will provide quantitative insight into why events happened.

Impact: Real-time analysis and reporting of sub exercise information to develop CONOPS.

S-Gate

Tech Solutions Partner:

NAVSEA Indian Head

- **Problem:** Need for greater security measures at entry to military facilities.
- **Solution:** Improve control and awareness of vehicular entry by replacing security guards with automatic access privileges for vehicles meeting the "right car - right driver" criterion. This will reduce the entry queue and improve security by allowing Security to concentrate labor-intensive searches on vehicles not meeting the criterion. Also, biometric identification will improve security measures by eliminating the possibility of stolen or forged identification, and improve situational awareness by providing a readily accessible record of who is on base.
- **Impact:** Right Car with Right Driver. Provides situational

Language Translation

Tech Solutions Partner:

US Army Intelligence Center

- **Problem:** Need for the technical integration of intelligence agency developed language ID, word spotting and text word spotting technologies into an established USMC SIGINT platform.

- **Solution:** Integrate machine language translation technologies,being developed by DARPA and other participants of the Language and Speech Exploitation (LASER) ACTD, into USMC Signals Intelligence (SIGNT) platforms. Once Integrated, these prototype systems will be evaluated by one of the USMC Radio Battalions. Assessment of value will be provided with recommended road-ahead.

- **Impact:** Tactical availability of translated documents and conversations ~ Making the haystack smaller.

HELGA

Tech Solutions Partner:

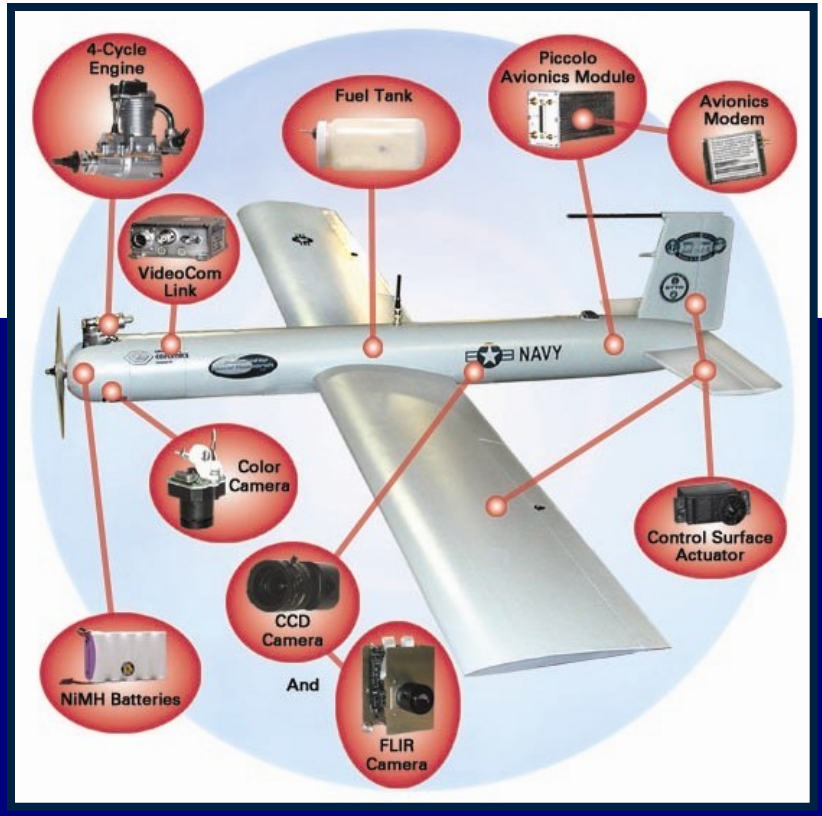
Naval Research

•**Problem:** Create a detector able to, in the presence of commercial shipping and Naval ship traffic, including nuclear carriers and other legitimate transit of nuclear and radiological materials, acquire environmental baseline data to support Homeland Defense.

•**Solution:** Use a High Energy Large Germanium Array to develop an understanding of stand-off radiation detection in the maritime environment, establish an environmental baseline in the presence of commercial and naval shipping, and quantify sensor performance. This scientific information will contribute to naval and homeland defense operations concerning nuclear and radiological materials as they relate to counterterrorism and counterproliferation.

•**Impact:** Standoff radiation detection, emphasis on coastal shipping traffic to guard against import of material that could be used for nuclear device or dirty bomb.

Silver Fox



Tech Solutions Partner:

Advanced Ceramics Research

Endurance: 3 – 5 hours
Flight control: Autonomous way-point navigation
Fuel: Model airplane fuel (Heavy fuel in future aircraft)
T/O: Autonomous from catapult
Landing: Autonomous with manual override
Flight Control station:
- Laptop and data link transmitter/receiver
- FalconView and PFPS integrated into control suite

Control Data Link: LOS spread spectrum (demo to 25 nm)
UC Berkeley Tracker Software:
- Enables convoy escort surveillance CONOPS
- Enabler for future SWARM capabilities